

PACAFI15-102

BY ORDER OF THE COMMANDER, PACIFIC AIR FORCES

PACAF INSTRUCTION 15-102

16 OCTOBER 1997

Weather

TROPICAL CYCLONE RECONNAISSANCE

OPR: HQ PACAF/DOWO (Capt William J. Carle)

Certified by: HQ PACAF/DOW (Col Charles W. French)

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This instruction implements AFPD 15-1, *Atmospheric and Space Environmental Support*, and USCINCPACINST 3140.1(W), or current version, Tropical Cyclone Operations Manual, prescribing procedures and responsibilities applicable to all USAF units in the USPACOM area. This publication does not apply to the Air National Guard or US Air Force Reserve units and members.

### ***SUMMARY OF REVISIONS***

Replaced references to the International Dateline with 180°. Clarified DMSP network responsibilities and tasking procedures. Specified satellite fix bulletin headers for area east of 180°. Satellite reconnaissance responsibilities moved from Osan AB to Yongsan AIN Korea. Radar reconnaissance responsibilities moved from Yongsan AIN and Osan AB to Camp Humphreys. Clarified satellite observation and intensity analysis procedures and updated description of PACAF Form 413. South Eastern Pacific Ocean tropical cyclone reconnaissance support for the NPMOC AOR is added. Added WDPN message example.

### ***Section A - General***

**1. References, Abbreviations, and Acronyms.** See Attachment 1.

**2. General.** Each year, tropical cyclones threaten US forces operating in the Pacific. Warnings and advisories are issued by the Joint Typhoon Warning Center (JTWC), Guam; the Central Pacific Hurricane Center (CPHC), Honolulu; and the Naval Pacific Meteorology and Oceanography Center (NPMOC), Pearl Harbor. JTWC's area of responsibility (AOR) is west of 180° to the east coast of Africa, north and south of the equator. CPHC's AOR is north of the equator, between 140° W and 180°. NPMOC's AOR is south of the equator, east of 180°.

### **3. Responsibilities:**

3.1. Commanders must protect their resources from tropical cyclone damage with minimum degradation to operational commitments and capabilities. They should seek the advice of their staff weather officers

(SWOs) when deciding how to balance these requirements. Commanders will set tropical cyclone Conditions of Readiness (COR) IAW Appendix H of USCINCPACINST 3140.1(W), or current version, on the advice of their supporting SWOs.

3.1.1. Conditions 1 through 4, as described in USCINCPACINST 3140.1(W), or current version, Appendix H, are applicable to all PACAF installations.

3.1.2. Installation commanders will establish the threshold wind speeds defining destructive winds for their respective installations.

3.2. SWOs will ensure local weather forecasts are based on tropical cyclone warnings issued by official US typhoon or hurricane warning centers and disseminate them to USAF and Army agencies, joint commands (where the SWO is an Air Force officer), and other agencies.

## ***Section B - Satellite Support***

**4. Participating Network Sites.** The following units comprise the Pacific DMSP Tropical Cyclone Reconnaissance Network (DMSP Network). Network sites can be contacted via the means described in Attachment 2.

<b><u>SITE LOCATION</u></b>	<b><u>ICAO</u></b>	<b><u>SITE #</u></b>	<b><u>OPR</u></b>
Nimitz Hill, Guam	PGTW	18	36 OSS/OSJ
Yongsan AIN, Korea	RKSZ	N/A	607 WS/DOFS
Kadena AB, Japan	RODN	19	18 OSS/OSW
Hickam AFB, Hawaii	PHIK	7	15 OSS/OSW
Offutt AFB, Nebraska	KGWC	3	AFGWC/DOPF
Diego Garcia	FJDG	N/A	NAVPACMETOCDET DIEGO GARCIA

## **5. DMSP Network Responsibilities.**

5.1. The 36 OSS/OSJ (Satellite Analyst) will:

5.1.1. Conduct 24-hour meteorological watch on all tropical and subtropical disturbances within the JTWC and NPMOC (area within GMS satellite coverage) AORs. Report positions, estimated intensities and warning criteria wind radii of significant tropical cyclones in these regions.

5.1.2. Conduct "on-the-spot" Quality Control (QC) of all tropical cyclone position and intensity estimates received from DMSP Network sites and resolve any discrepancies at that time.

5.1.3. Make and disseminate geostationary tropical cyclone observations with positions every 3 hours and positions and intensities every 6 hours.

5.1.4. Provide 15 OSS/OSW a copy of PACAF Form 413 recording all fixes accomplished on tropical cyclones transitioning outside the GMS satellite coverage in the NPMOC AOR as required.

5.2. 36 OSS/OSJ (MSC) will:

5.2.1. Manage daily operations and tasking of DMSP Network sites for tropical cyclone reconnaissance

support within the JTWC AOR.

5.2.2. Be authorized direct contact with all PACAF DMSP Network sites including AFGWC.

5.2.3. Provide an end-of-year storm summary of network tropical cyclone position and intensity estimate accuracy relative to the JTWC final "best-tracks." This summary will be contained within the Annual Tropical Cyclone Report (ATCR).

5.2.4. Monitor DMSP Network site performance for tropical cyclones within the JTWC AOR. Identify problems and provide the responsible unit with feedback along with recommended corrective actions. Information copies will be sent to the appropriate squadron and HQ PACAF/DOWO.

5.2.5. Inform the Director, JTWC of the overall status of the DMSP Network.

5.2.6. Coordinate transfer of network control with Deputy Director, JTWC, and inform 15 OSS/OSW when they are to assume responsibility for the DMSP Network IAW para 6.7. of this instruction. Ensure network MSCs are also informed of the change by the most expeditious means available.

5.2.7. Notify all MSCs when 36 OSS/OSJ has resumed control of the DMSP Network.

5.3. 15 OSS/OSW will:

5.3.1. Assume control of the DMSP network when 36 OSS/OSJ must curtail operations.

5.3.2. Make and disseminate geostationary tropical cyclone observations with positions every 3 hours and positions and intensities every 6 hours for tropical cyclones in the JTWC AOR when 36 OSS/OSJ is not operational.

5.3.3. Coordinate with the CPHC as outlined in the National Hurricane Operations Plan (NHOP) and Section F of this instruction.

5.3.4. Provide two tropical cyclone position and intensity reports per tropical cyclone per day to NPMOC for tropical cyclones outside the GMS coverage (not seen by JTWC) in the Southeast Pacific (NPMOC AOR) as required.

5.4. DMSP Network MSCs will:

5.4.1. Call all tropical cyclone position and intensity reports to 36 OSS/OSJ, or alternate (15 OSS/OSW), when required, as soon as possible after completion, and after longline transmission. Discrepancies will be discussed and resolved at that time.

5.4.2. Establish written procedures for "after-the-fact" product QC.

5.4.3. Monitor new tropical and subtropical disturbances until dissipation, or until a Tropical Cyclone Formation Alert (TCFA), warning, or tasking message is received.

5.4.4. Notify 36 OSS/OSJ or alternate when required, immediately upon identifying a previously unreported tropical disturbance with an intensity estimate of T1.0, ST1.0, or greater. Similarly, 15 OSS/OSW will notify CPHC of tropical disturbances meeting the above criteria within their AOR. For tropical cyclones approaching 180°, 15 OSS/OSW will provide a copy of PACAF Form 413, recording all fixes accomplished, to 36 OSS/OSJ.

5.4.5. Report change in site status, green, amber, or red, to 36 OSS/OSJ or 15 OSS/OSW as required.

5.4.5.1. Site status GREEN means fully operational and mission capable.

5.4.5.2. Site status AMBER means partially operational and partially mission capable.

5.4.5.3. Site status RED means not operational and not mission capable.

5.4.6. Operate and maintain the METSAT Wide Area Network (WAN) server and make satellite imagery available to the PACAF Virtual Weather Service on a 24-hour per day basis (includes 611 OSF/WE at Elmendorf AFB, AK).

## **6. DMSP Network Tasking Procedures.**

6.1. The METSAT reconnaissance network controller (36 OSS/OSJ or 15 OSS/OSW) will call each site to confirm receipt of either the TCFA message or the first tropical cyclone warning message if a TCFA was not initially issued.

6.2. Each site upon receipt of the first warning or TCFA will determine the first available polar orbiter satellite fix and notify the METSAT reconnaissance network controller (36 OSS/OSJ or 15 OSS/OSW) via telecon. After receipt of the first warning or TCFA, each network site will provide position, intensity and where necessary, wind distribution reports for a minimum of two reports per day for each system within their METSAT footprint. Network sites will prioritize their polar orbiting METSAT passes in the following order:

6.2.1. All polar passes between 1 hour before and 30 minutes after the warning time (in the warning window).

6.2.2. All DMSP passes closest to warning times.

6.2.3. All NOAA passes closest to warning times.

6.2.4. All other DMSP passes.

6.2.5. All other NOAA passes.

6.3. Task AFGWC for tropical cyclone position and intensity estimates when applicable.

6.4. Append to each TPXX10 bulletin, the next available satellite report using the format dd/TTTTz. The XX is the basin identifier as defined in paragraph 8.2. of this instruction.

6.5. All sites will use the TPXX10 bulletin header for transmission of the fix bulletin into the Automated Weather Network (AWN).

6.6. When a TCFA is in effect or a suspect area is defined by JTWC, 36 OSS/OSJ will monitor the area primarily using geostationary METSAT data.

6.7. The designated METSAT reconnaissance network controller (36 OSS/OSJ or 15 OSS/OSW) will use the daily 1900Z NOPA44 PGTW bulletin to transfer network control (if required) and report the status (i.e., GREEN, AMBER, RED) of individual sites within the METSAT reconnaissance network.

**7. Training.** To facilitate cooperation between 36 OSS/OSJ and DMSP Network locations, MSCs must understand JTWC's METSAT requirements and fundamental tropical cyclone positioning and intensity analysis techniques.

7.1. 36 OSS/OSJ will:

7.1.1. Develop and maintain a training program for DMSP Network MSCs outlining tropical cyclone reconnaissance responsibilities.

7.1.2. Conduct a training program (approximately 1 week depending on individual experience) for new MSCs. Training will include tracking polar-orbiting satellites, DMSP capabilities, imagery enhancement, tropical cyclone positioning, Dvorak analysis, intensity coding techniques, theory and application of

microwave imagery to JTWC warning support, and other areas deemed necessary.

7.1.3. Conduct an annual MSC workshop. The workshop will be an open forum to discuss new techniques, review standardized procedures, and develop close working relationships between DMSP Network members.

7.2. Unit commanders will:

7.2.1. Ensure the MSC is provided training at JTWC.

7.2.2. Ensure the MSC or alternate is available to participate in the annual MSC workshop and the annual tropical cyclone conference.

7.3. MSCs will:

7.3.1. Develop and maintain a unit training program that emphasizes those skills required to support their tropical cyclone reconnaissance mission.

7.3.2. Train at least one weather forecaster (depending on traditional tasking requirements) to assist in the tropical cyclone reconnaissance duties.

7.3.3. Develop and maintain a continuity binder outlining key MSC responsibilities and duties.

7.3.4. Attend the annual MSC workshop. If the MSC is unable to attend, the alternate will be sent.

7.3.5. Prepare and present workshop briefings as tasked by 36 OSS/OSJ.

## **8. Tropical Cyclone Reports and Headings.**

8.1. Tropical Cyclone Satellite Position/Intensity Log (PACAF Form 413) will be used by all PACAF DMSP sites for analyzing and recording tropical cyclone position and intensity estimates. Retain PACAF Form 413 until the ATCR is published. Column headings and entries for PACAF Form 413 are listed in Attachment 3. A full explanation of terms used is contained in NOAA Technical Report NESDIS 11, Tropical Cyclone Intensity Analysis Using Satellite Data and JTWC/SATOPS/TN-97/002.

8.2. The PACAF DMSP sites will transmit position and intensity messages via the AWN. The format will be IAW Appendix D of USCINCPACINST 3140.1(W), or current version. For positions and intensity estimates taken from polar orbiter data, spacecraft, orbit number, and data type (e.g., VIS, IR, EIR) will be included as mandatory remarks. Manual of Operations (MANOP) headers are as follows:

8.2.1. TPPN10: for tropical cyclones in the North Pacific Ocean (west of 180°) and South China Sea.

8.2.2. TPPZ1: for tropical cyclones in the North Pacific Ocean (east of 180°).

8.2.3. TPIO10: for tropical cyclones in the North Indian Ocean (Bay of Bengal and Arabian Sea).

8.2.4. TPPS10: for tropical cyclones in the South Pacific Ocean east of 135°E.

8.2.5. TPXS10: for tropical cyclones in the South Indian Ocean west of 135°E.

8.3. The PACAF DMSP Tropical Cyclone Reconnaissance sites will implement the JTWC/SATOPS/TN-97/001 Fix Codes for development of a PCN set. The Fix Codes will be included in the remarks section.

## **9. Post-Storm Requirements:**

9.1. 36 OSS/OSJ may require all data used for positioning and intensity analysis. If digital archive capability is available, archive "fix" passes and keep archive tapes on site for 2 years. 36 OSS/OSJ will

ask for archive tapes as required. All other data will be forwarded to the designated archive site IAW AFMAN 37-139.

9.2. 15 OSS/OSW, at the conclusion of each tropical cyclone in CPHC's AOR, will advise HQ PACAF/DOWO of any problems encountered in providing support. PACAF Form 413s, may be requested by HQ PACAF/DOWO; otherwise, satellite pictures will be retained IAW AFMAN 37-139.

## **10. Special Sensor Microwave Imagery (SSM/I) Requirements:**

10.1. MSCs will:

10.1.1. Ensure that SSM/I imagery is used as per JTWC/SATOPS/TN-97/003, when available, to verify fix positions when an eye is not present using conventional imagery alone.

10.1.2. Provide tropical cyclone positions using only SSM/I where spacecraft overflying tropical cyclones only have this capability. It is understood there will be no intensities with these positions.

10.1.3. Ensure that imagery of tropical cyclones are saved to magnetic tape. Save surface winds, 37 differential (37D), 19 horizontal (19H), and 85 horizontal (85H) GHz using large Mercator format. Images do not have to be saved if the satellite's swath covers less than half the tropical cyclone.

10.1.3.1. Maintain SSM/I imagery on magnetic tape until the ATCR is published.

10.1.3.2. Provide SSM/I imagery to 36 OSS/OSJ upon request.

10.1.4. Provide 36 OSS/OSJ with 35-kt wind radii for all tropical cyclones in their AOR estimated at a Dvorak intensity of 3.0 or greater. If wind radii are reported with a fix position, include them in paragraph H of the TPXX10 bulletin.

10.1.5. Enter all SSM/I data on the PACAF Form 413 to include: satellite ID, nodal time/longitude, orbit number, fix position, and 35-kt wind radii coordinates. Maintain PACAF Form 413s until the ATCR is published and send to 36 OSS/OSJ upon request.

10.1.6. Notify the MSC at 36 OSS/OSJ of changes in their operational capability to ingest and process SSM/I data.

## ***Section C - Radar Support***

**11. Radar Reconnaissance.** This section describes the role of USAF units in the Pacific Radar Tropical Cyclone Reporting System. The purpose of the reporting system is to ensure that timely, high quality radar observations are made available to appropriate warning agencies (JTWC or CPHC). The importance of these reports cannot be overemphasized.

**12. Radar Reporting.** USAF units possessing either AC&W or weather radars, will take special radar observations as required by USCINCPACINST 3140.1(W), or current version, para 3-9 to 3-12. Attachment 4 lists units with active weather radars.

12.1. AC&W sites will phone their reports to the nearest USAF or USN weather station where the reports will be transmitted on the AWN; reporting format is in Appendix E to USCINCPACINST 3140.1(series). Bulletin heading for tropical cyclone radar reports are listed in Attachment 5.

12.2. USAF weather radar sites listed in Attachment 4 will take special radar observations as required by USCINCPACINST 3140.1(series), para 3-12. Sites possessing conventional weather radars will use techniques described in AFMAN 15-113, Weather Radar Observations, to fix tropical cyclone centers. USAF weather radar sites will ensure appropriate personnel are knowledgeable of and comply with standard procedures for reporting of tropical cyclones.

12.3. Units listed in Attachment 4 possessing a WSR-88D radar will make tropical cyclone position reports to the Joint Typhoon Warning Center (JTWC) whenever a tropical cyclone is within range or detected regardless of warning or condition of readiness status. Reports will be made by longline transmission and telephone. Report format will be IAW Appendix E to USCINCPACINST 3140.1(W), or current version. Reports will be hourly IAW USCINCPACINST 3140.1(W), or current version. Units, through the radar manager, will ensure accessibility to real-time radar information by operators of Principle User Processor located at JTWC or other designated back-up site.

12.4. USAF weather station SWO will make contact with AC&W radar sites in their area on the approach of a tropical cyclone to alert the site for data requirements. Where possible, unit SWOs should provide training on observation and reporting procedures to AC&W operators.

#### ***Section D - Tropical Cyclone Information Bulletin***

**13. Responsibilities.** The local SWO will provide installation commanders with forecasts of the expected onset, intensity, and duration of winds, and other weather associated with tropical cyclones at their installations. This information will also be transmitted via the WDPN bulletin on the AWN. Additionally, the US Forces Korea Theater Forecast Unit (USFK-TFU) will provide area forecasts for their AOR in the Tropical Cyclone Discussion Bulletin, WHKO RKSZ.

**14. Purpose.** During periods when tropical cyclones are threatening US Pacific Command (USPACOM) installations, the National Military Command Center, Air Force Operations Center, and major commands possessing assets or facilities on these installations continually monitor the weather and on-site actions taken to prevent or minimize damage. The WDPN and WHKO bulletins serve as a primary source of tropical cyclone forecast information for briefings to operational customers at selected commands and operations centers.

**15. Preparation of Bulletins.** As a minimum, PACAF weather units identified in attachment 6 will prepare an initial bulletin whenever a tropical cyclone is located, or is forecast to be located during the next 24 hours, within 300NM of any DOD facility or installation for which they have support responsibility. If the tropical cyclone is not expected to significantly affect facilities, installations, or operations, and local customers have determined that a change in tropical cyclone condition of readiness is not warranted, bulletins need only contain the words "NEGATIVE-SEE LATEST TAF(s)." A bulletin will also be prepared in those instances when a tropical cyclone is not forecast to be within the area, but significant operational decisions such as evacuation, termination of exercise, etc., are being made because of a tropical cyclone.

15.1. JTWC or their alternate is responsible for issuing official tropical cyclone warnings west of 180°. The CPHC in Honolulu issues official tropical cyclone warnings for the area between 140°W to 180°, north of the equator. A new bulletin will be issued after each JTWC/CPHC warning or until such time as

the tropical cyclone no longer poses a threat to the installation(s), in which case, the last bulletin will be identified with "LAST." Bulletins will not be extended. A new one will be issued when new or revised information is briefed to the local customer.

15.2. WDPN bulletins must be consistent with the issuing unit's terminal aerodrome forecast (TAF) and the JTWC/CPHC warnings.

15.3. When available, weather units will use the applicable nomograms in 1 WW/TN-80/001, Prediction of Typhoon induced Peak Winds at Four Pacific Stations, to aid in preparing WDPN bulletins. Units are authorized to use approved computer programs for the purpose of producing a WDPN bulletin. However, units must also maintain manual proficiency in producing WDPN bulletins in case of computer failure.

**16. Bulletin Content.** WDPN and WHKO bulletins will contain meteorological information that is not already generally available to the weather community. Only meteorological information will be included--operational decisions, such as aircraft evacuation, will not be mentioned.

16.1. The information listed below is mandatory. Those items marked with \*\* are not required in WHKO bulletins.

16.1.1. Wind Forecast.

16.1.2. Onset/duration/speed of operationally significant crosswinds (determined locally).\*\*

16.1.3. Onset and duration of 25 knot crosswind based on gusts.\*\*

16.1.4. Onset and duration of 50 knot winds based on gusts.

16.1.5. Onset, duration and speed of destructive winds (threshold determined locally).\*\*

16.1.6. Maximum sustained wind.

16.1.7. Peak wind and time of occurrence including gusts.

16.1.8. Closest point of approach (CPA) and time of occurrence.\*\*

16.1.9. Remarks, including any additional significant information briefed to local customers, such as onset of heavy precipitation and the amount expected.

16.2. Attachment 7 contains a sample WDPN bulletin.

**17. Bulletin Transmission.** Bulletins will be transmitted via the AWN as soon as possible after local command and control agencies (i.e., commander, command post) have been briefed.

**18. Use of Bulletins.** Weather forecasters and briefers at all echelons will use WDPN and/or WHKO bulletins to brief operational decision makers. Deviations from bulletins will be coordinated with the unit responsible for issuing them.

### ***Section E - Alternate Joint Typhoon Warning Center (AJTWC) Support***

**19. General.** In the event that 36 OSS/OSJ cannot maintain responsibility as DMSP Network hub due



to communications outage, equipment problems, etc., the 36 OSS/OSJ MSC will coordinate transfer of network control to 15 OSS/OSW and the 15 OSS/OSW MSC, who then serves as interface between activated AJTWC and network units providing satellite reports on tropical cyclones. The 15 OSS/OSW MSC will then assume responsibility for providing satellite imagery, imagery analysis, metwatch, positioning, and intensity estimates of tropical and subtropical cyclones, and all other normal operations supporting the AJTWC.

## **20. Responsibilities:**

20.1. 15 OSS/OSW will:

20.1.1. Arrange for, and provide, satellite support to the AJTWC.

20.1.2. Direct the operation of the DMSP Network whenever the AJTWC is activated and when informed by 36 OSS/OSJ to assume responsibility of the DMSP Network. Tasking procedures will be IAW para 2.3.

20.1.3. Acknowledge assumption of DMSP Network control responsibility from 36 OSS/OSJ and inform the DMSP Network MSCs of the same.

20.1.4. Determine the availability of satellite resources with respect to AJTWC warning requirements, to include pass coverage, time, and spacecraft.

20.1.5. Coordinate satellite tasking with the AJTWC Typhoon Duty Officer (TDO).

20.1.6. Inform 36 OSS/OSJ of current tasking and overall site status upon the return of DMSP Network control responsibility.

**21. Real-Time Reporting.** Whenever 15 OSS/OSW assumes control of the DMSP Network, sites will coordinate their tropical cyclone position reports with 15 OSS/OSW prior to transmission, if possible. 15 OSS/OSW will quality control these phone reports for accuracy prior to forwarding to the AJTWC.

## **22. Training:**

22.1. 15 OSS/OSW will participate in all exercise activations of the AJTWC.

22.2. The 15 OSS/OSW MSC and Meteorological Satellite Specialist (MSS) will complete training at 36 OSS/OSJ upon assignment to MSC/MSS duties. Network orientation training should be scheduled during the early part of the storm season. Annual refresher should be completed just prior to the yearly, scheduled AJTWC activation.

22.3. 15 OSS/OSW will train a sufficient number of assigned forecasters to support AJTWC operations.

## ***Section F - Hawaii/Johnston Island (JI) Hurricane Support***

## **23. Responsibilities:**

23.1. All PACAF weather units will use the warning issued by the Central Pacific Hurricane Center (CPHC) when producing forecasts and WDPNs for the Hawaiian Islands and Johnston Island.

23.2. All weather units with responsibilities under this chapter will annually review their tropical cyclone

support procedures. Changes in support will be coordinated through HQ PACAF/DOW.

## **24. Procedures:**

24.1. 15 OSS/OSW will:

24.1.1. Provide 24-hour Met watch for tropical cyclones moving to or forming within 800NM of the Hawaiian Islands or Johnston Island.

24.1.1.1. During weekends and holidays, notify HQ PACAF/DOW of such occurrences. This is an initial notification for each storm only.

24.1.1.2. Provide tropical cyclone forecast information to Field Command Johnston Island (FCJ) whenever tropical cyclones are within 800NM of, or are forecast to be within 800NM of, Johnston Island within 24 hours.

24.1.2. Prepare WDPN bulletins whenever a tropical cyclone is located, or is forecast to be located during the next 24 hours, within 300NM of Hickam AFB and Johnston Island.

24.1.2.1. Brief tropical cyclone forecasts and WDPN bulletins for Hickam AFB and Johnston Island to PACAF Command Center Controllers until such time as the PACAF Crisis Action Team (CAT) Weather Cell is activated.

24.1.2.2. Brief tropical cyclone forecasts and WDPN bulletins for Johnston Island to the USARPAC Command Center Duty Officer until such time as the USARPAC Staff Weather Officer (SWO) is recalled.

24.1.2.3. Brief tropical cyclone forecasts and WDPN bulletins for Johnston Island to FCJ as applicable.

24.2. 25 ASOS/DOW will provide all requested tropical cyclone support to CG 25 ID, Commander, USASCH Emergency Operations Center, Bradshaw AAF, and Wheeler AAF.

## **25. Form Prescribed:**

25.1. **PACAF Form 413**, Tropical Cyclone Satellite Position/Intensity Log. The purpose of this form is to log tropical cyclone positions and intensities from satellite observations.

STEVEN R. POLK, Maj Gen, USAF

Director of Operations

7 Attachments

1. Glossary of References, Abbreviations, and Acronyms
2. DMSP Tropical Cyclone Reconnaissance Network

3. PACAF Form 413 Column Heading and Entries
4. Active Radar Sites
5. Bulletin Headings
6. WDPN/WHKO Responsibility
7. Sample WDPN Bulletin Format

## **Attachment 1**

### **GLOSSARY OF REFERENCES, ABBREVIATIONS, AND ACRONYMS**

#### **References**

USCINCPAC Instruction 3140.1(W), or current version, Tropical Cyclone Operations Manual.

NOAA Technical Report NESDIS 11, Tropical Cyclone Intensity Analysis Using Satellite Data.

AFI 15-118, Requesting Specialized Weather Support.

AFMAN 37-139, Records Disposition Schedule.

AFI 37-138, Records Disposition--Procedures and Responsibilities.

AFMAN 15-113, Weather Radar Observations.

FCM-P12-19YY National Hurricane Operations Plan.

1 WW/TN-80/001, Prediction of Typhoon induced Peak Winds at Four Pacific Stations.

JTWC/SATOPS/TN-97/001, Updating Tropical Cyclone Satellite-Derived Position Code Number Criteria.

JTWC/SATOPS/TN-97/002, Intensity Estimation of Tropical Cyclones During Extratropical Transition.

JTWC/SATOPS/TN-97/003, Tropical Cyclone Positioning Using Microwave Imagery.

#### **Abbreviations and Acronyms**

AC&W	Aircraft Control and Warning
AFGWC	Air Force Global Weather Center
AJTWC	Alternate Joint Typhoon Warning Center
AOR	Area of Responsibility

ATCR	Annual Tropical Cyclone Report
AWN	Automated Weather Network
CAT	Crisis Action Team
CG	Commanding General
COR	Condition of Readiness
CPA	Closest Point of Approach
CPHC	Central Pacific Hurricane Center
DMSP	Defense Meteorological Satellite Program
FCJ	Field Command Johnston Island
GMS	Japanese Geostationary Meteorological Satellite
JTWC	Joint Typhoon Warning Center
MANOP	Manual of Operations
METSAT	Meteorological Satellite
MSC	Meteorological Satellite Coordinator
MSS	Meteorological Satellite Specialist
NHOP	National Hurricane Operations Plan
NPMOC	Naval Pacific Meteorology and Oceanography Center
OPR	Office of Primary Responsibility
QC	Quality Control
SSM/I	Special Sensor Microwave Imager
SWO	Staff Weather Officer
TAF	Terminal Aerodrome Forecast
TCFA	Tropical Cyclone Formation Alert
TDO	Typhoon Duty Officer
USFK-TFU	US Forces Korea Theater Forecast Unit
USPACOM	US Pacific Command

## **Attachment 2**

### **DMSP TROPICAL CYCLONE RECONNAISSANCE NETWORK**

#### **KEY ADDRESS AND TELEPHONE NUMBERS**

(All numbers DSN unless otherwise indicated.)

#### **A2.1. NIMITZ HILL, GUAM**

##### **A2.1.1. 36 OSS/OSJ**

Telephone: 349-6227 (primary)	Satellite Operations (SATOPS)
349-7116 (alternate)	METSAT Coordinator
349-7131	NCOIC SATOPS
349-6106 (FAX)	

Message: NAVPACMETOCCEN WEST GU//SATOPS//

Mail: 36 OSS/OSJ  
PSC 455 Box 20  
FPO AP 96540-0051

E-Mail: msc@npmocw.navy.mil

##### **A2.1.2. JTWC**

Telephone: 349-5302 (primary)	Typhoon Duty Officer
349-5301 (alternate)	Typhoon Duty Assistant
349-5240	Director, JTWC

Message: NAVPACMETOCCEN WEST GU/JTWC//

Mail: U.S. Naval Pacific Meteorology and Oceanography Center West/  
Joint Typhoon Warning Center  
PSC 455 Box 17  
FPO AP 96540-0051

E-Mail: jtldr@npmocw.navy.mil  
jtops@npmocw.navy.mil

## **A2.2. YONGSAN AIN, KOREA**

### **A2.2.1 HQ 607 WS/DOF**

Telephone: 725-6155 (primary)	METSAT Coordinator
725-6156 (alternate)	METSAT Coordinator
725-7820 (alternate)	(FAX) METSAT Coordinator

Message: 607 WS SEOUL/ KOR//DOF//

Mail: HQ 607 WS/DOF  
Unit # 15173  
APO AP 96205-0108

E-Mail: owend@usfk.korea.army.mil

### **A2.2.2. HQ 607 WS/DO**

Telephone: 725-6509 (primary)	607 WS Director of Operations
725-3516 (alternate)	607 WS Director of Operations
725-6155 (primary)	USFK-TFU Forecaster
725-6156 (alternate)	USFK-TFU Forecaster

Message: 607WS SEOUL KOR//DO//

Mail: 607 WS/DO  
Unit # 15173  
APO AP 96205-0108

E-Mail: roissierm@usfk.korea.army.mil

## **A.2.3. KADENA AB, JA**

Telephone: 634-3156 (primary)	METSAT Coordinator-BWS
634-3155 (alternate)	METSAT Coordinator-BWS
634-3140 (alternate)	Duty Forecaster-BWS

Message: 18OSS KADENA AB JA//OSW//

Mail: 18 OSS/OSW  
Unit 5177  
APO AP 96368-5177

E-Mail: ks2osw@emh.kadena.af.mil

#### **A2.4. HICKAM AFB, HAWAII**

Telephone: 449-1634 (primary)	METSAT Coordinator - BWS
449-6262 (alternate)	Duty Forecaster - BWS
448-4412 (FAX)	Fax - BWS

Message: 15OSS HICKAM AFB HI//OSW//

Mail: 15 OSS/OSW  
800 Hangar Ave  
Hickam AFB HI 96853-5244

E-Mail: base\_weather@cidss.af.mil

#### **A2.5. AFGWC, OFFUTT AFB, NEBRASKA**

Telephone: 271-7264 (primary)  
271-1389 (alternate)  
271-3963 (site-3 satellite operations team chief)  
271-2586 (operations center team chief)

Message: AFGWC OFFUTT AFB NE//DOPF// (tropical section)  
AFGWC OFFUTT AFB NE//SYC// (site-3 satellite ops)

Mail: HQ AFGWC/DOPF  
106 Peacekeeper Drive STE 2N3  
Offutt AFB NE 68113-4039

#### **A2.6. HQ PACAF/DOW**

Telephone: 449-6174 (DOW)



448-5283 (DOWO)  
449-8904 (DOWX)  
448-8962 (FAX)

Message: HQ PACAF HICKAM AFB HI//DOW//

Mail: HQ PACAF/DOW  
25 E St STE I232  
Hickam AFB HI 96853-5426

#### **A2.7. AJTWC**

Telephone: 474-4834 (primary)	Typhoon Duty Officer (TDO)
471-0004 (alternate)	TDO
474-5305 (alternate)	Director, AJTWC

Message: NAVPACMETOCCEN PEARL HARBOR HI//30//

Mail: Commanding Officer  
NAVPACMETOCCEN  
Box 113  
Pearl Harbor HI 96860-5050

#### **A2.8. CENTRAL PACIFIC HURRICANE CENTER**

Telephone: 973-5284 (primary)	Hurricane Forecaster
973-5280 (alternate)	24-h District Desk
973-5285	Satellite Analyst

These are commercial numbers - call the Pearl Harbor Switch at DSN 430-0111 and ask for a patch to the commercial number.

Mail: Central Pacific Hurricane Center  
National Weather Service Forecast Office  
Honolulu International Airport  
Honolulu, Hawaii 96819

## **A2.9. NAVPACMETOC DET DIEGO GARCIA**

Telephone: 370-3670 (primary)  
370-3590 (alternate)

Message: NAVPACMETOC DET DIEGO GARCIA//00//

Mail: METOC  
PSC 466 Box 10  
FPO AP 96595-0010

E-Mail: [metoc@nsfda.navy.mil](mailto:metoc@nsfda.navy.mil)

### Attachment 3

#### PACAF FORM 413 COLUMN HEADING AND ENTRIES

COLUMN HEADING (In Sequence)	ENTRY
TROPICAL CYCLONE	Enter name and number of tropical cyclone.
OB	Sequential number of observations for the tropical cyclone.
MONTH	Month of observation encoded in two digits.
DATE/TIME	6-digit Date Time Group (UTC). For polar orbiters, use the nodal crossing time. Compute the relevant nodal crossing time for descending orbits.
LAT (LaLaLaC)	Center position latitude to nearest tenth degree. C is the checksum. Circle N or S (North or South).
LON (LoLoLoLoC)	Center position longitude to nearest tenth degree. C is the checksum. Circle E or W (East or West).
PCN	Position Code Number. Enter odd numbers if gridding based on geography (circulation center is within 10 degrees of the gridded feature). Enter even numbers if gridding is ephemeris-based.
SBC WRAP OR SHEAR DISTANCE	Use the DT column corresponding to the amount of wrap on the Log10 spiral or the distance (NM) that the LLCC is sheared from/embedded into deep convection.
EYE	Enter either the VIS embedded distance or the EIR surrounding gray shade meeting the minimum width criteria. Enter the corresponding E# and the necessary Eye Adjustment Value from NOAA TR NESDIS 11.

CDO	Central Dense Overcast. Enter diameter (NM) of CDO.
EMB	Embedded Center. Enter the grayshade used and the distance (NM) from the center to the edge of that gray shade meeting the minimum distance criteria.
DATA-T COMP	Data-T computation. $CF$ (central feature) + $BF$ (banding feature) = $DT$ .
CCC	Central Cold Cover. Check if CCC is observed.
TREND	Enter D (developed), S (steady) or W (weakened) followed by the rate of change. Use “+” for rapid rate of change, “-” for slow rate, or leave blank for a normal rate of change. Use the rules as outlined in NOAA TR NESDIS 11.
MET	Model Expected T#. Adjustment of the final intensity from 24hrs (18-30h) ago. MET is the T# based on the D,W, or S and the rate as noted in the previous column.
PT	Pattern T#. Based on the charts in NOAA TR NESDIS 11. Use the MET value derived from the previous column as a baseline and adjust if necessary.
DVORAK CODE	Intensity estimation code. T#/CI/Trend/Period. T# is the Final intensity number. CI = Current Intensity. Trend/Period is amount of Final T# change over a specified period (18-30 h). Example: T3.0/3.0/D1.0/24HRS.
STT	Short Term Trend. Used if system change is < 18h. Also used to supplement the Trend encoded within the Dvorak Code. An example is when the Dvorak Code trend indicates no intensity change from 24 hours ago but the storm actually weakened (indicating the system has possibly peaked) within

the last 12 hours.

SPACECRAFT

Enter the spacecraft number or name, the revolution number and the satellite sensor(s) used.

FIX TYPE

The type of center encoded in the Lat/Lon columns. Enter LLCC (Low Level Circulation Center), ULCC (Upper Level Circulation Center), or CSC (Cloud System Center).

FIX CODE

Enter the appropriate fix code.

REMARKS

Enter PBO (position based on) followed by the primary method used to position the circulation center, EYE, SBC, CDO, ANMTN, etc. Include qualifying parameters when applicable (eye diameter/definition, outflow patterns, etc.) If an intensity estimation was done, enter DBO (Dvorak based on) DT, PT or MET.

SITE FIXES

Check the column corresponding to the appropriate site. Use the blank column for other sites not listed.

INITIALS

Initials of the satellite analyst.

**Attachment 4**  
**ACTIVE RADAR SITES**

<b><u>LOCATION</u></b>	<b><u>UNIT OF ASSIGNMENT</u></b>
Andersen AFB, Guam	36 OSS/OSW
Hickam AFB, Hawaii	15 OSS/OSW
Kadena AB, Japan	18 OSS/OSW
Yokota AB, Japan	374 OSS/OSW
Kunsan AB, Korea	8 OSS/OSW
Camp Humphreys, Korea	Det 2, 607 WS

**Attachment 5**  
**BULLETIN HEADINGS**

**A5.1.** AC&W sites using PACAFI 15-102 to report fixes will use bulletin heading WOXX PHWR DTG.

**A5.2.** AC&W sites using WMO code FM-20-VIII (RADOB) to report fixes will use bulletin headings.

A5.2.1. SDXX79 PHWR DTG.

A5.2.2. WOPA1 PHWR DTG.

**Attachment 6**  
**WDPN/WHKO RESPONSIBILITY**

<b><u>ISSUING UNIT</u></b>	<b><u>DOD INSTALLATION(S) TO BE INCLUDED</u></b>
36 OSS/OSW	Andersen AFB, Guam
15 OSS/OSW	Hickam AFB, Hawaii Johnston Island
18 OSS/OSW	Kadena AB, Japan
35 OSS/OSW	Misawa AB, Japan
374 OSS/OSW	Yokota AB, Japan
51 OSS/OSW	Osan AB, Korea
8 OSS/OSW	Kunsan AB, Korea
HQ 607 WS (USFK-TFU)	Republic of Korea (by area)



**Attachment 7**

**SAMPLE WDPN BULLETIN FORMAT**

WDPN\_\_\_\_\_ (ICAO IDENTIFIER) \_\_\_\_\_DTG\_\_\_\_\_ (AMD)

TROPICAL CYCLONE FORECAST FOR (DOD Installation/Area)

(Tropical Cyclone Name) AS FORECAST BY (JTWC) (AJTWC) (NWS CPHC) WARNING (#)  
ISSUED AT (DTG)

**A. WIND FORECAST:**

10/0000Z	040/15G25	11/0000Z	190/55G70
10/0600Z	060/26G35	11/1200Z	250/15G25
10/0800Z	080/30G40		
10/1200Z	160/45G55		
10/1800Z	160/60G75		

(or SEE LATEST TAF)

**B. ONSET/DURATION OF 15KT CROSSWIND: 10/0300Z FOR 30 HRS.**

**C. ONSET/DURATION OF 25KT CROSSWIND: 10/0700Z FOR 24 HRS.**

**D. ONSET/DURATION OF 50KT WINDS: 10/1400Z FOR 12 HRS.**

**E. ONSET/DURATION/SPEED OF DESTRUCTIVE WINDS: 10/0000Z FOR 16 HRS/40KTS.**

**F. MAXIMUM SUSTAINED WINDS: 60KTS.**

**G. PEAK WIND: 78KTS AT 11/0100Z.**

**H. CPA: 50NM SE AT 11/0100Z.**

**I. REMARKS: 5 INCHES OF RAINFALL EXPECTED STARTING AT 11/0000Z.**